Restoring Interoperability to the Lower 700 MHz Band

July 11, 2013

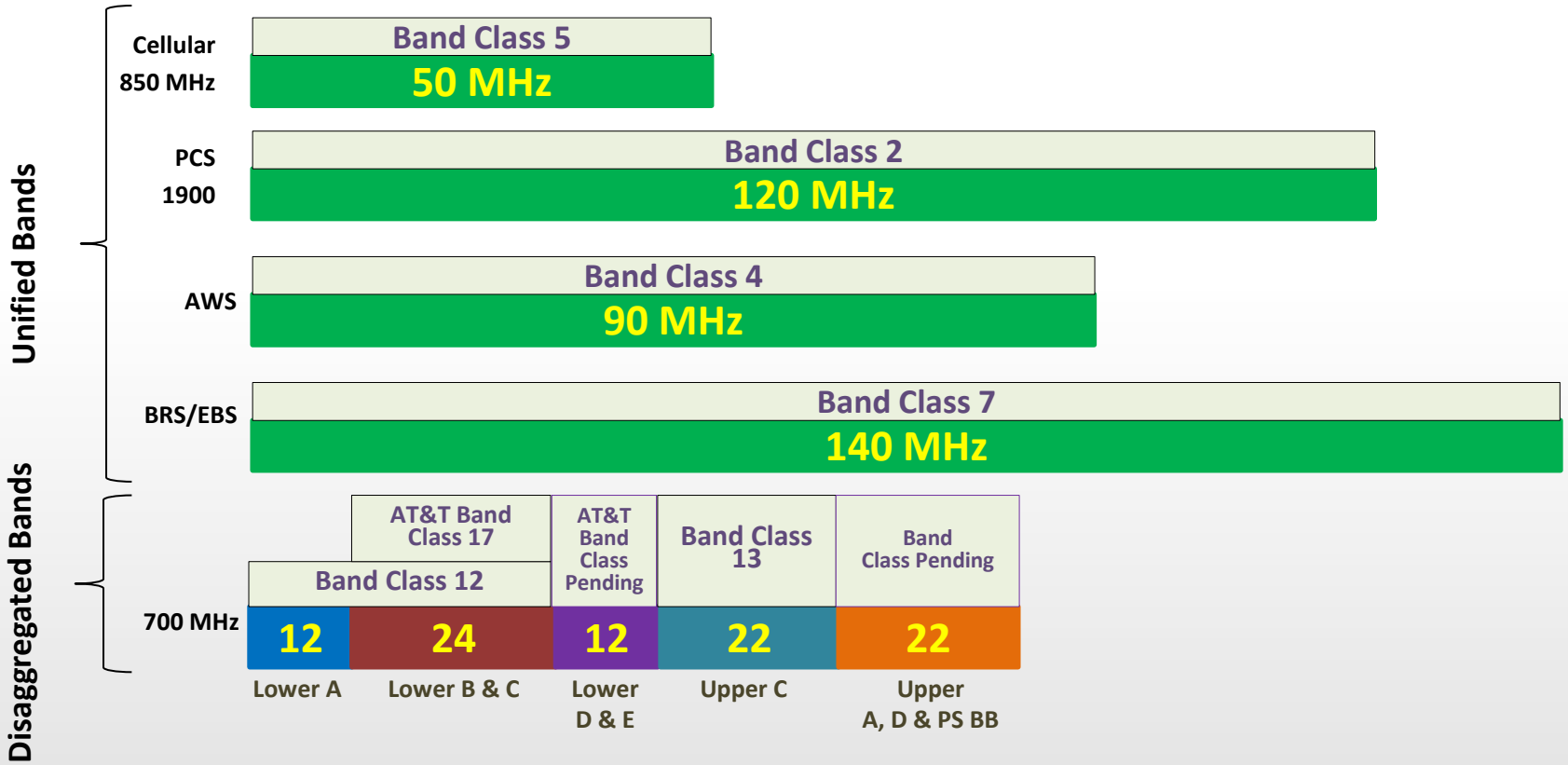
The Commission Should Act Promptly to Restore Interoperability in the Lower 700 MHz Band

- **Clear Technical Support.** The only reliable technical evidence before the Commission demonstrates that Lower 700 MHz interoperability will not adversely impact Lower B and C Block device reception. Opponents of interoperability have consistently failed to provide any measurements or empirical data to the contrary.
- **Significant Public Interest Benefits.** There is widespread agreement that restoring interoperability would empower consumers by removing artificial device- and network- related limitations, promoting competition, stimulating innovation, facilitating nationwide roaming, and enhancing spectrum efficiency.
- **Legal Authority.** The Commission has clear legal authority to adopt an interoperability solution under these circumstances, which constitute a "worst-case" scenario for which regulatory action is necessary.

Activity Timeline for Lower 700 MHz Band Interoperability

- ***Dec 2007 (prior to auction)*** Only Band Class 12 was under consideration by 3GPP
- ***March 2008*** Auction closes with $19 B in revenue
- ***May 2008*** Motorola submits paper to 3GPP proposing Band Class 17 – only covers B and C Blocks
- ***June 2008*** Ericsson questions reason for fracturing the band into separate band classes; Ericsson removes objections after AT&T supports Band Class 17
- ***September 2008*** 3GPP ratifies Band Class 17 and Band Class 13 (Verizon's Upper C Block)
- ***September 2009*** A Block licensees petition FCC for device interoperability
- ***December 2010*** 3GPP ratifies Band Class 12 with 1 MHz guard band
- ***November 2011*** Ericsson requests that an additional 1 MHz of guard band be provided by Band Class 12 to protect spectrum being acquired from Qualcomm; AT&T speaks at 3GPP in favor of request
- ***December 2011*** FCC grants approval to AT&T acquisition of Qualcomm D and E Block licensees without conditions addressing interoperability
- ***March 2012*** FCC adopts Interoperability NPRM
- ***June-July 2012*** Major lab and field test reports demonstrate no interference risk to Lower B and C Block operations with interoperable devices

Band Disaggregation Remains Unique to the Lower 700 MHz Band



Interoperability Produces Numerous Benefits

Consumer Benefits: Availability, Affordability, and Customer Satisfaction
Increases availability and affordability of end user equipment and mobile service options
Reduces switching costs for consumers seeking to change providers
Enhances customer satisfaction and retention through lower costs, more options, and shorter wait periods
Increases competition in pricing and services

Competitive Carrier Benefits: Device Scale, Roaming, and Competition
Increases economies of scale for small and regional carriers by participation in a larger ecosystem
Enhances nationwide roaming opportunities for small and regional carriers
Promotes greater competition for next-generation wireless services, especially in rural areas

Spectrum Efficiency and 4G Deployment Benefits
Encourages more efficient use of licensed spectrum that is currently not substantially deployed
Helps alleviate the current spectrum crunch
Accelerates 4G deployment throughout the country
Provides an incentive for broader participation in future spectrum auctions

Public Interest Benefits: Innovation, Investment, and Job Growth
Creates a larger and more diverse device ecosystem that will spur innovation in the Lower 700 MHz band
Unleashes billions of dollars of investment in 4G LTE networks, creating over 100,000 jobs during the next 5 years

No Interference Impediments to Interoperability

- Interoperability Proponents:
  - **Channel 51 signals do not cause harmful interference to Band 12 devices.**
    - The Hyslop-Kolodzy Study on Band 17 (and extrapolated Band 12) consumer devices demonstrated that Channel 51 transmissions raise no interference concerns for interoperability.
    - The V-COMM Study measured Band 12 and Band 17 devices, confirming HK results.
  - **Lower E Block signals do not cause harmful interference to Band 12 devices.**
    - The HK Study on Band 17 (and extrapolated Band 12) consumer devices revealed that devices sold to consumers are protected from E Block transmissions, demonstrating that the E Block raises no interference concerns for interoperability.
    - The V-COMM laboratory tests of Band 12 and Band 17 devices confirmed that the E Block raises no interference concerns for interoperability.
- Interoperability Opponents:
  - Qualcomm did not test 700 MHz components or devices.
  - AT&T commissioned a flawed test of one device for Channel 51 intermodulation (corrupted test environment, so cannot ensure unbiased results; cannot replicate test results; never tested E Block)

Extensive Lab and Field Testing Shows Harmful Interference Will Not Occur

	Lower E Block		Channel 51	
	Lab Tests	Field Tests	Lab Tests	Field Tests
Hyslop-Kolodzy	YES (2 devices tested)	YES	YES (2 devices tested)	YES
V-Comm	YES (7 devices tested)	YES	YES (7 devices tested)	YES
AT&T	NONE	NONE	FLAWED • Specified inadequate emissions control, rendering invalid results (Only 1 device tested)	NONE
Qualcomm	NONE	NONE	FLAWED • Used 2 GHz (European Band) components • Hypothetical device performance assumptions	NONE

Interoperability Requires Virtually No Additional Equipment or Infrastructure Spending

Considerations	Changes	Additional Costs
700 MHz Handsets antennas, duplex filters, power amplifiers, low noise amplifiers, base band hardware, base band software	**No change** OEM simply installs interoperable filter and software at the factory in lieu of present filter and software	**No additional cost** OEM simply uses interoperable filter instead of non-interoperable filter at the factory – a replacement with no material difference in cost at scale
700 MHz Base Stations antennas, duplex filters, power amplifiers, low noise amplifiers, base band hardware, base band software, network controls	**No change, except a one-time software upgrade** to allow the base station to interoperate with devices supporting all A, B and C Block channel numbering	**No material cost** Carrier implements the requisite software change during the routine software-update cycle. (While software development could, generously, cost perhaps $2 M, this figure represents a small fraction of LTE software expenses and an even smaller fraction of overall LTE system costs.)
Channel 51 and 700 MHz E Block Incumbents including all deployed Channel 51 operations and any 700 MHz E Block deployments	**No change** Extensive field and laboratory testing shows no changes required	**No additional cost** Band 12 and Band 17 systems have identical performance specifications to manage Channel 51 operations. Band Class 12 already effectively manages high power E Block deployments

Moving Channel 51 Broadcasters Will Not Resolve Interoperability Concerns

- Channel 51 full power broadcasters must be protected by adjacent A Block licensees, which present network deployment challenges in roughly 30 markets.
- Requiring Channel 51 broadcasters to move would assist some A Block licensees with base station deployment obstacles, but would not solve the problems of economies of scale, roaming, competition, spectrum efficiency, and consumer harm that the current lack of interoperability creates.
- AT&T may keep Band Class 17 even if all Channel 51 broadcasters were moved, especially given AT&T's incentive to maintain and expand the non-interoperable Band Class 17 for carrier aggregation and special features.

Industry-based Solutions Will Not Emerge

- FCC action is essential.
  - Interoperability opponents have expressed mid- to long-term commitment to the bifurcated ecosystem.
  - Vendors will not oppose the direction indicated by their largest customer in the Lower 700 MHz Band.
- The Commission has clear legal authority to adopt an interoperability solution

The FCC Has Ample Legal Authority to Restore Interoperability in the 700 MHz Band

- Restoring interoperability would not depart from FCC precedent as the FCC has previously implemented wireless interoperability and other wireless device requirements
  - The FCC previously mandated interoperability in the 800 MHz band, requiring that "all units must be capable of operating at least over the entire 40 MHz" [1]
  - For E911 services, the FCC required carriers to deploy identification-capable handsets[2]
  - The FCC extended automatic roaming to data, allowing host carriers to refuse an agreement if would require "economically unreasonable" changes to host network but not if it would require economically reasonable network changes[3]

1 *Inquiry Into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems*, Report & Order, 86 FCC 2d 469 (1981)

2 *See, e.g., Revision of Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Fourth Memorandum Opinion and Order, 15 FCC Rcd. 17442 (2000); *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 18676 (1996)

3 Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services, WT Docket No. 05-265, Second Report and Order, FCC 11-52 (rel. Apr. 7, 2011)

The FCC Has Multiple Grounds for Authority

1) Section 316 allows the FCC to modify licenses[5]
   - The DC Circuit has held that data roaming[6] and DTV transition[7] were not impermissible fundamental changes

2) Under section 303(b), the FCC may "prescribe the nature of the service" rendered[8]
   - Interoperability is intrinsic to the nature of the service
   - The DC Circuit upheld the analogous data roaming rule[9]

3) Section 706 requires the FCC to encourage deployment of broadband[10]
   - The FCC determined that section 706 provides independent authority to regulate practices that limit competition in telecommunications markets[11]
   - The DC Circuit is currently reviewing this question in the Open Internet challenge[12]

5 *See* 47 U.S.C. § 316; *Cellco P'ship v. FCC*, 700 F.3d 534 (D.C. Cir. 2012)
6 *Cellco P'ship v. FCC*, 700 F.3d 534 (D.C. Cir. 2012)
7 *Community Television, Inc. v. FCC,* 216 F.3d 1133 (D.C. Cir. 2000)
8 *See* 47 U.S.C. § 303(b)
9 *Cellco P'ship v. FCC*, 700 F.3d 534 (D.C. Cir. 2012)

10 *See* 47 U.S.C. § 706
11 *Preserving the Open Internet Broadband Industry Practices*, Report and Order, 25 FCC Rcd 17905 (2010)
12 *See Verizon et al. v. FCC*, No. 11-1355, Document No. 1415568 (D.C. Cir, Jan. 16, 2013) (brief for the Appellee/Respondents)

The FCC Has Multiple Grounds for Authority

4) Sections 201 and 202 allow the FCC to prohibit unreasonable constraints by carriers[13]
   - These sections apply to common carriage, and the FCC's definition of "common carriage" receives *Chevron* deference[14]

5) The FCC may impose conditions on licenses under sections 304, 307, and 309[15]
   - The DC Circuit has held that post-grant conditions are permitted if reasonable[16]
   - AT&T's behavior after the auction created the current situation[17]

6) The FCC also has ancillary regulatory authority[18]

13 *See* 47 U.S.C. § § 201, 202
14 *Cellco P'ship v. FCC*, 700 F.3d 534 (D.C. Cir. 2012)
15 *See* 47 U.S.C. §§ 304, 307, & 309
16 *See Mobile Relay Assocs. v. FCC*, 457 F.3d 1 (D.C. Cir. 2006)
17 *Promoting Interoperability in the 700 MHz Commercial Spectrum*, Reply Comments of RCA – The Competitive Carriers Association., WT Docket No. 12-69, 12 (filed July 16, 2012)
18 *See* 47 U.S.C. §§ 301, 303(r)

The FCC Holds Ample Authority and Agency Interpretation of Authority Receives Deference

- The Supreme Court has stated that Title III endows the Commission with "expansive powers" and a "comprehensive mandate to 'encourage the larger and more effective use of radio in the public interest.'"[19]

- The DC Circuit explicitly noted that "Title III affords the Commission 'broad authority to manage spectrum . . . in the public interest.'"[20]

- The FCC's interpretation of its statutes receives *Chevron* deference and the Supreme Court's recent decision, *City of Arlington v. FCC*, extends *Chevron* deference to agencies' interpretations of their own jurisdiction[21]

19 *Cellco P'ship v. FCC*, 700 F.3d 534 (D.C. Cir. 2012) (quoting NBC v. United States, 319 U.S. 190, 219 (1943)).
20 *Cellco P'ship v. FCC*, 700 F.3d 534 (D.C. Cir. 2012)
21 *City of Arlington v. FCC*, No. 11-1545 (May 20, 2013)